REMARKS

By this amendment, claims 50-52 have been amended. Claim 53 has been newly added. Claims 30, 32-44, 46, 48, and 49-53 are pending in the application. Applicants reserve the right to pursue the original claims and other claims in this and other applications.

The amendment filed on October 26, 2007 is objected to for allegedly including new matter in claims 50-52. Also, claims 50 and 51 are rejected under 35 USC 112, first paragraph for allegedly failing to comply with the enablement requirement. The objection and rejection are respectfully traversed. Support for claims 50 and 51 may be found in the specification at least at paragraph [0139] of the specification, which reads:

> "The process of production of the polarization hologram 90 according to the present invention is not limited to the embodiment of FIG. 16A through FIG. 16F. In an alternative embodiment, before fixing the birefringence layer 93 to the transparent substrate 92 by the adhesion layer 95, the periodic grating pattern of the birefringence layer 93 may be formed first. After the formation of the birefringence layer 93, it may be fixed to the transparent substrate 92 by the adhesion layer 95."

Claim 51 has been amended to recite that the substrate and the transparent substrate are different substrates. Support for this amendment can be found in paragraph [0148], which recites that "a polyamide acid solution...is applied to a flat surface of glass substrate (or a silicon substrate)" which is different from the transparent substrate 92 described in paragraph [0120]. Applicant respectfully requests that the objection and rejection be withdrawn and the claims allowed.

Claims 30, 50, and 51 are rejected under 35 USC 112, second paragraph for allegedly being indefinite. Applicants respectfully submit that there is no inconsistency between claims 30, 50, and 51. Claim 30 does not recite that the steps listed in claim 30 be performed in any particular order. It is improper to read a specific order of steps into method claims where the language of the method claims does not impose a specific order on the performance of the method steps. *Altiris Inc. v. Symantec Corp.*, 318 F.3d 1363, 1371, 65 USPQ2d 1865, 1869-70 (Fed. Cir. 2003). Applicant respectfully requests that the rejection be withdrawn and the claims allowed.

Claims 30-32 and 35-42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,739,952 ("Takeda '952") in view of U.S. Patent No. 5,244,713 ("Nakamura") and U.S. Patent No. 5,793,733 ("Takeda '733"). The rejection is respectfully traversed.

With regard to claims 30-32 and 35-42, it would not be obvious to combine Takeda '952, Nakamura, and Takeda '733 to arrive at the claimed invention. The Supreme Court recently held in *KSR Int'l Co. v. Teleflex Inc.* that "the [Graham] factors continue to define the inquiry that controls" a finding of obviousness and reiterated that a "patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art." 127 S. Ct. 1727, 1734 (U.S. 2007).

Claim 30 recites, *inter alia*, "drying said substrate and removing said organic polymer material from said substrate; heating and stretching said organic polymer material to form a uni-directionally stretched birefringence layer; attaching said uni-directionally stretched birefringence layer onto a transparent substrate with an adhesive

layer." The Office Action acknowledges that Takeda '952 does not teach these limitations. (Office Action, page 3). The Office Action states that Nakamura teaches that "an organic polymer film is heat treated and then uniaxially stretched, (i.e. uni-directionally stretched) to make the film have optimum birefringence," and that Takeda '733 teaches forming a periodic grating pattern using a photo-resist layer with a mask. (Office Action, pages 3-4). As evidence that Takeda '952, Nakamura and Takeda '733 may be properly combined and that the claims are obvious in light of these references, the Office Action merely states that it would have been obvious to "use the well-known heating and uniaxial stretching method and the well known organic polymer materials" of Nakamura in the method taught by Takeda '952 "for the benefit of using a manufacture method to obtain *optimum* bifringence of the film, and to cut manufacturing cost by using conventionally accessible and known polymer materials." (Office Action, page 3). As to the reason why one skilled in the art would be motivated to combine the photo-resist and mask method of Takeda '733 with the process of Takeda '952 the Office Action only states it would be "for the benefit of perhaps providing the capability of mass producing such holograms by using a standard photo-mask." (Office Action, page 4). Applicants respectfully disagree with these statements.

Applicants respectfully submit that one of ordinary skill in the art would not look to Nakamura to substitute the process of uni-axially stretching a film taught by Nakamura (column 4, lines 14-18) for the process of evaporating a monomeric diacetylene film onto a substrate and rubbing a film to orient it in one direction as taught by Takada '952 (column 8, lines 20-23) for the purpose of "obtain[ing] *optimum* bifringence of the film" as stated by the Office Action, because Takada '952 does not teach or suggest the orientation of the film produced by the method of Takada '952 is less than optimal or requires improvement in

any way. Nor does Nakamura teach or suggest that the heating and stretching method of Nakamura could improve the method of Takada '952.

To the contrary, Takeda '952 teaches that "the polydiacetylene film can be provided with in-plane orientation by merely rubbing the film in one direction". (column 8, lines 42-48). Further, because Nakamura does not teach that the films of Nakamura may be used as a polarized beam splitter, Nakamura does not teach that the film may be optimized for the polarized beam splitter taught by Takeda '952 nor that the film of Nakamura would actually improve the polarized beam splitter of Takeda '952 in any way. The phrase "the above obtained optical film is subjected to uniaxial or biaxial stretching so as to possess the optimum bifringence" as used by Nakamura (column 4, lines 14-18) merely indicates that the film may be stretched to a desired amount, but does not indicate that the optical film of Nakamura would actually improve the polarized beam splitter of Takeda '952 in any way and therefore would not provide motivation.

The Office Action argues that "by adopting the teachings of 'heating and stretching' of polymer layer of Nakamura would certainly benefit the process of making the polymer layer to have good birefringence property, for the heating process frees the molecules for orientation." (Office Action, page 17). This argument misses the point. To make a *prima facie* case for obviousness, the Office Action must provide "some teaching, suggestion, or motivation...to combine reference teachings." Federal Register/Vol. 72, No. 195/Wednesday, October 10, 2007 Notices, page 57534. The Office Action has only shown that Nakamura teaches heating and stretching (to free the molecules) of common thermoplastic resin to form an optical film. (Nakamura, column 2, line 52 – column 3, line 12). However, Takeda '952 teaches rubbing (to heat and free the molecules) of a specialized material (polydiacetylne) to form a polarizing beam splitter. (Abstract,

Column 3, lines 36-67). The Office Action has not shown any motivation as to why one would be motivated to substitute the heating and stretching process of Nakamura for the rubbing method of Takeda '952, especially because the two references teach the use of different materials and because Takeda '952 teaches away from the substitution as described below.

In *KSR*, the Court reiterated the importance of secondary considerations to the *Graham* factors. *Id.* at 720. The various polymer materials taught by Nakamura cannot be properly combined with the process or product of Takada '952 because Takada '952 teaches away from the combination.

The Office Action states that Takeda '952 teaches using "ANY birefringent layer having refractive indicies (n_e/n_o)" and that "[t]he polarization beam splitter is based on this...alone." (Office Action, page 18). Applicant respectfully disagrees with this statement. To the contrary, Takeda '952 only teaches using an oriented polymer film made of polydiacetylene in a polarizing beam splitter. Takeda '952 teaches that it is desirable to use an oriented film made of polydiacetylene for very specific reasons, for example, because polydiacetylene 1.) "is inherently small in the temperature dependency of refractive index and hence, it contributes to enhancement in the environmental resistance of the polarizing beam splitter," 2.) "has inherently high crystallinity and hence contributes to uniformity in the characteristics of the polarizing beam splitter," and 3.) has the "ability to cause a great degree of birefringence and, hence, it can be formed in a sufficiently small thickness to realize a compact polarizing beam splitter" (column 7, line 66 to column 8, line 8). Therefore, Takada '952 teaches that it is desirable to use polydiacetylene as the polymer in the oriented film and teaches away from substituting another polymer, such as any of the "conventionally accessible and known polymer

materials" taught by Nakamura, as suggested by the Office Action. Nakamura, on the other hand, does not teach forming a film out of polydiacetylene nor does Nakamura teach that the films of Nakamura may be used as a polarized beam splitter. One of ordinary skill in the art would not have looked to Nakamura to substitute a conventional polymer for the specialized polymer taught by Takada '952 without the benefit of improper hindsight.

Furthermore, one of ordinary skill in the art would not look to Nakamura to substitute the process of uni-axially stretching a film taught by Nakamura (column 4, lines 14-18) for the process of rubbing a film to orient it in one direction as taught by Takeda '952 (column 8, lines 20-23) because the process of Nakamura is necessarily more complex than the process of Takeda '952.

Takeda '952 teaches that "the polydiacetylene film can be provided with in-plane orientation by merely rubbing the film in one direction" and that the rubbing process "contribute[s] to easy fabrication of the polarizing beam splitter". (column 8, lines 42-48). The process of Takeda '952 involves only forming a monomeric diacetylene film over the glass substrate, polymerizing the diacetylene, and rubbing the polymer to orient it in one direction. (column 8, lines 14-23). Nakamura, on the other hand, teaches continuously preparing a thermoplastic resin film by solvent casting while maintaining a proper concentration and reducing periodic thickness variation (column 3, lines 22-54), presumably removing the film from a casting belt or roll, heating the film to the proper temperature and stretching the film while maintaining a proper stretch ratio (column 4, lines 19-41), heat treating the film (column 4, lines 42-50), and, assuming *arguendo* that the film could be combined with the polarizing beam splitter of Takeda '952, the film would have to be cut to a proper size, aligned with a substrate, and somehow attached. Therefore, one of ordinary skill in the art would not substitute the simple and efficient

process taught by Takeda '952 with the complex process taught by Nakamura without the benefit of improper hindsight.

Further, with regard to claim 30, the Office Action fails to make a *prima facie* case of obviousness because neither Takeda '952 nor Nakamura provide a reasonable expectation of success by combining Nakamura with Takeda '952. Takeda '952 teaches using an "oriented polydiacetylene film" in a polarizing beam splitter for the very specific reasons discussed above. Neither Takeda '952 nor Nakamura provide a reasonable expectation that substituting any of the common polymers taught by Nakamura with the polarizing beam splitter of Takeda '952 would produce a successful polarizing beam splitter.

The Office Action states that "the intended use does not prevent one skilled in the art to extract the basic disclosure concerning the birefringent property of the layer." (Office Action, page 18). However, Applicant submits that one important disclosure concerning the property of the birefringent layer taught by Takeda '952 is the use of polydiacetylene film. The Office Action is improperly picking and choosing by ignoring this disclosure of Takeda '952.

Claim 43 has been rejected by the Office Action in view of Takeda '952 and Nakamura using similar reasoning as was provided for claim 30. (Office Action, pages 10-11). Applicant traverses this rejection for reasons similar to those given above with regard to claim 30.

Furthermore, claim 30 recites, as amended, *inter alia*, "forming an isotropic overcoat layer to enclose said birefringence layer" where the birefringence layer comprises an "organic polymer material." Takeda '952 does not teach or suggest this limitation. To the

contrary, Takeda '952 only discloses that an isotropic material may be used with Examples 8-10, 14, and 15. (column 20, lines 8-19). None of Examples 8-10, 14 and 15 teach that the birefringent film may be a polymer. Takeda '952 is explicit about which types of films may be used with an isotropic material, and therefore it would not be obvious to combine the isotropic material with the other Examples of Takeda '952. Moreover, the Office Action has not provided any reasoning as to why it would be obvious to combine the various embodiments of Takeda '952. Nakamura and Takeda '733 do not cure the deficiency of Takeda '952. Since Takeda '952 and Nakamura do not teach or suggest all of the limitations of claim 30, claim 30 is not obvious over the cited references.

With regard to claims 37-39, the Office Action acknowledges that the cited references "do not teach explicitly to have the particular values claimed in the claims." (Office Action, page 8). Applicant respectfully submits that the cited references do not teach or disclose any refractive indices which are close to Applicant's cited refractive indices. Again, a *prima facie* case of obviousness has not been properly set forth. *See* M.P.E.P. § 2144.05. Nor has the Office Action addressed this argument. Instead, the Office Action appears to be explicitly relying on improper hindsight by stating that "such modification is considered to be obvious matters of design choices to one of ordinary skill in the art to make the birefringence film with desired refractive indices so that the polarization beam splitter with the holographic grating pattern will behave as desired." (Office Action, page 8). With regard to claim 37, the cited references do not disclose or suggest "a refractive index . . . in said one direction of stretching is about 1.62," as recited in claim 37. With regard to claim 38, the cited references do not disclose or suggest that "the refractive index for said organic polymer material in a direction perpendicular to said

one direction of stretching is about 1.49." The cited references do not disclose or suggest the refractive index for a birefringent film in a perpendicular direction.

With regard to claims 40 and 41, the Office Action manipulates equations 26 and 28 of Takeda '952 to reach the final conclusion that:

$$OPD(o) = (n_o - n_c)d2 = (2m+1)\lambda \text{ ; and}$$

$$OPD(e) = (n_e - n_c)d2 = m\lambda$$

(Office Action, page 9). Even assuming, *arguendo*, that the Office Action's assumptions are correct, Applicant respectfully submits that the equations taught by Takeda '952 as manipulated by the Office Action are not equivalent to the equations of claims 40 and 41. Claim 40 contains the equation "(ns-n1)h=(m±½)L" where "m is an integer (m=0, ±1, ±2, ….)". The Office Action stipulates that "m" as used in Takeda '952 must be a whole number to create an odd multiple of π. (Office Action, page 8). Therefore, the Takeda '952 equations are not equal to the equations of claim 40 because "(2m+1)" from the Takeda '952 equation (where m is a whole number) cannot equal "(m±½)" from the claim 40 equation where "m is an integer (m=0, ±1, ±2, ….)". Therefore, Takeda '952 does not teach the limitations of claim 40. Claim 41 contains the equation "(np-n1)h= (m±½)L" and Takeda '952 does not disclose this limitation for the same reason.

Claims 31-32 and 35-42 depend from claim 30, and should be allowable for at least the reasons provided above, and on their own merits. Claims 44 and 46 depend from claim 43, and should be allowable for at least the reasons provided above, and on their own merits. In view of the above remarks, Applicant respectfully requests that the rejection of claims 30-44 and 46 be withdrawn.

Claims 33-34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Takeda '952, Nakamura, Takeda '733, and further in view of U.S. Patent No. 5,245,456 ("Yoshimi") and U.S. Patent No. 6,040,418 ("Yamamoto"). The rejection is respectfully traversed. Claim 33 depends from independent claim 30 and claim 34 depends from claim 33. For at least the reasons provided above regarding claim 30, claims 33 and 34 should be similarly allowable with claim 30. In addition, the "requisite prior art suggestion to combine becomes less plausible when the necessary elements can only be found in a large number of references. . . ." *Eli Lilly & Co. v. Teva Pharms. USA, Inc.*, 2004 U.S. Dist. LEXIS 14724 at *104; 2 *Chisum on Patents* § 5.04[1][e][vi]. In the present application, the lack of identifiable objective motivation to combine the five references, in addition to the sheer number of disparate references applied by the Office Action, is sufficient to overcome the asserted obviousness arguments.

Claims 48 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Number 5,245,471 ("Iwatsuka") in view of Nakamura. The rejection is respectfully traversed.

The Office Action fails to establish a *prima facie* case of obviousness at least because Iwatsuka in view of Nakamura, even if properly combinable, do not teach or suggest every element of independent claim 48. Claim 48 recites, *inter alia*, "wherein the polarization hologram is configured to substantially satisfy the following requirements:... (np-n1)h=*m*L (ns-n1)h=(m±1/2)L." Iwatsuka does not disclose this limitation. Iwatsuka discloses in formulas (III) and (IV) that:

(III): $(n_{1+}-n_2)d = (N_1\lambda)$

(IV): $(n_1-n_2)d = (N_2+1/2)$

(column 4, line 67-column 5, line 1). Assuming *arguendo* that np = n_{1-}, ns = n_{1+}, n1 = n_2, d = h, L = λ, and N_1 and N_2 both = m (which they do not), then:

formula (III) teaches (ns-n1)h=(mL)

formula (IV) teaches (np-n1)h=(m+1/2),

which do not meet the limitation of claim 48.

The Office Action states that Equation IV of Iwatsuka is misprinted. Even if this assumption is true, Iwatsuka does not teach the limitations of claim 48. The reason that Iwatsuka does not teach the limitations of claim 48 is immaterial, the fact remains that Iwatsuka does not teach the limitation. Since Iwatsuka and Nakamura do not teach or suggest all of the limitations of claim 48, claim 48 is not obvious over the cited references.

With regard to claims 48 and 49, Iwatsuka does not teach "forming a uni-directionally stretched organic polymer layer over said substrate". The Office Action states it would be obvious to "use a birefringence layer that is comprised of an uniaxially stretched polymer layer" as taught by Nakamura "for the benefit of allowing different materials being used to form the polarization grating and at same time using a birefringence layer that is made to have *optimized* birefringence which is essential for the function of the polarization hologram." (Office Action, page 12). Applicant respectfully disagrees. One of ordinary skill in the art would not look to substitute the polymer film taught by Nakamura for the inorganic birefringent material (column 5, lines 31-42) used in the polarizer taught by Iwatsuka merely "for the benefit of allowing different materials

being used to form the polarization grating" as asserted by the Office Action. The statement that the materials are different is a mere truism, and does not describe an actual benefit that would motivate one of ordinary skill in the art to change materials.

Further, one of ordinary skill in the art would not look to Nakamura to substitute the process of uni-axially stretching a film taught by Nakamura (column 4, lines 14-18) for the process of depositing an inorganic film by oblique deposition taught by Iwatsuka (column 5, lines 31-42) for the purpose of "obtain[ing] *optimum* bifringence of the film" as stated by the Office Action, because Iwatsuka does not teach that the inorganic film is less than optimal. To the contrary, Iwatsuka specifically discloses the materials and the thickness of the individual layers required to achieve the diffraction phenomena. (column 4, lines 6-40). Further, Iwatsuka relies only on the materials and the thickness of the individual layers and does not require further treatment to align the layers. Thus, there is no motivation to use a uniaxially stretched birefringence film to optimize birefringence in the polarizer of Iwatsuka because the polarization beam splitter of Iwatsuka does not require stretched film. Further, because Nakamura does not teach that the films of Nakamura may be used as a polarizer, Nakamura does not teach that the film may be optimized for the polarized beam splitter taught by Takeda '952. The phrase "the above obtained optical film is subjected to uniaxial or biaxial stretching so as to possess the optimum bifringence" as used by Nakamura (column 4, lines 14-18) merely indicates that the film may be stretched to any degree desired.

Further, one of ordinary skill in the art would not look to Nakamura to substitute the process of uni-axially stretching a film taught by Nakamura (column 4, lines 14-18) for the process of forming an inorganic film by oblique deposition as taught by Iwatsuka (column 5, lines 31-42) because the process of Nakamura is necessarily more complex.

Iwatsuka teaches that the inorganic film formed by oblique deposition "has a fibrous columnar structure tilted with respect to the substrate, or an anisotropic structure, which gives rise to a difference between the refractive index relative to the linearly polarized light in the tilted direction and the refractive index relative to the linearly polarized light in the orthogonal direction". (column 5, lines 58-64). Therefore, the process of Iwatsuka involves only depositing an inorganic film over the glass substrate. (column 5, line 64 to column 6, line 4). Nakamura, on the other hand, teaches continuously preparing a thermoplastic resin film by solvent casting while maintaining a proper concentration and reducing periodic thickness variation (column 3, lines 22-54), presumably removing the film from the casting belt or roll, heating the film to the proper temperature and stretching the film while maintaining a proper stretch ratio (column 4, lines 19-41), heat treating the film (column 4, lines 42-50), and assuming *arguendo* that the film could be combined with the polarizing beam splitter of Iwatsuka, the film would have to be cut to a proper size, aligned with a substrate, and somehow attached. Therefore, one of ordinary skill in the art would not substitute the simple and efficient process taught by Iwatsuka with the complex process taught by Nakamura without the benefit of improper hindsight.

Therefore, in view of the above remarks, Applicant respectfully requests that the rejection of claims 48 and 49 be withdrawn.

Claims 43-44 and 46 stand rejected under the judicially created doctrine of obviousness type double-patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,618,344 ("Funato"). The rejection is respectfully traversed. Applicant respectfully submits that the claims of the present application recite important limitations that are not obvious over the claims of Funato. For instance, claim 1 of Funato recites an *optical pickup*

apparatus with "a birefringence layer of a stretched organic polymer material." Claims 2-9 of Funato depend from claim 1.

Claim 43 of the present application, in contrast, defines a *polarization hologram* structure and recites "a uni-directionally stretched birefringence layer with a periodic grating pattern comprising organic polymer material affixed to said *unpatterned* substrate . . . wherein the depth of said periodic grating pattern is essentially equal to a thickness of said uni-directionally stretched birefringence layer." (emphasis added). Claim 1 of Funato does not disclose that the depth of the periodic grating pattern is essentially equal to a thickness of a uni-directionally stretched birefringence layer, much less an *unpatterned* substrate. Applicant respectfully requests that the Examiner withdrawn the double patenting rejection.

In view of the above, Applicant believes the pending application is in condition for allowance.

Dated: March 25, 2008

Respectfully submitted,

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